AGENDA
TC 7.6 Building Energy Performance
Monitoring and Energy Performance Subcommittee
2020 ASHRAE Annual Conference, Virtual
Monday, June 15, 2020, 2:00 – 4:00 pm

Purpose: TC 7.6 is concerned with the estimation, measurement, analysis, benchmarking, and management of whole building and building systems energy and water performance. This includes performance and resource management of new and existing buildings. This sub-committee implements this scope by monitoring the state of governmental policy, data, and tools addressing building energy and water performance (especially building benchmarking and energy auditing), and by developing ASHRAE programs and courses on these topics.

1. **Introductions**

2. **ASHRAE Standards and Guidelines**
   a. **Standard 100-2018**, *Energy Efficiency in Existing* Buildings
      i. Targets adopted in Washington State building energy performance standard;
      ii. Canada has performed modeling for developing Canadian targets;
      iii. EUI targets in the process of being updated to CBECS 2012 data and may be updated to CBECS 2018 data
   b. **Standard 105-2014**, *Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions*
      i. Completed response to first public review comments; includes changes to diagram of energy flows into and out of buildings
   c. **Standard 211-2018**, *Standard for Commercial Building Energy Audits*
      i. No updates
   d. **Standard 189.1**, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*
      i. Getting ready to publish 2020 version this fall
      ii. For next publication cycle Working Group 7.5 is developing an outcome-based compliance path; still working on which metrics to use and how to enforce
   e. **Standard 228P**, *Standard Method of Evaluating Zero Energy Building Performance*
      i. Proposed change to add carbon to title, purpose and scope
   f. **Guideline 14-2014**, *Measurement for Energy, Demand, and Water Savings*
      i. Currently being updated
   g. **Guideline 34-2019**, *Energy Guideline for Historic Buildings*
      i. No updates
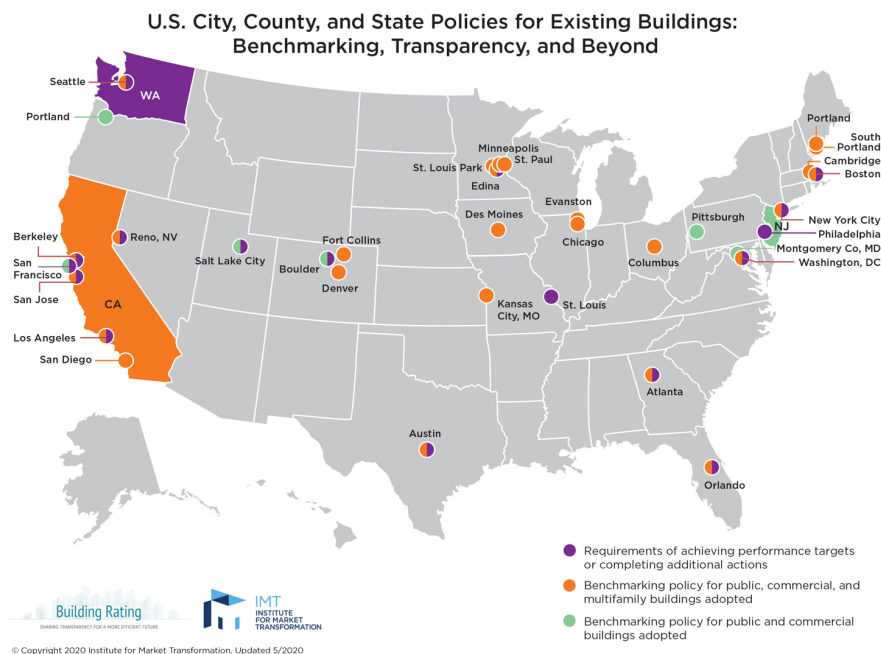   h. **AEDG, Achieving Zero Energy series**
      i. No updates

3. **Buildings, Energy, and COVID-19**
   a. Daily electricity demand in NYC fell about 13% due to COVID-19 mitigation efforts: https://www.eia.gov/todayinenergy/detail.php?id=43635
   b. Similar decrease in the central region of the U.S., but not for other areas of the country, such as Florida. Differences likely due to regional differences in end-use sector consumption (e.g., closure of manufacturing in Midwest): https://www.eia.gov/todayinenergy/detail.php?id=43636
   c. IEA report on COVID-19 impacts on electricity: https://www.iea.org/reports/covid-19-impact-on-electricity

   i. Electricity demand dropped with confinement, but is steadily recovering

   ii. Across all areas, power mix has shifted towards renewables; in U.S. natural gas has been leading course, but renewables have outpaced coal-fired power plants

 d. USGBC updates LEED in response to COVID-19, including pilot credits on social distancing, air quality and infection monitoring, etc.

   i. https://chainstoreage.com/usgbc-updates-leed-response-covid-19

   ii. https://www.hpac.com/covid-19/article/21131545/association-solutions-sustainability-green-building-leed-energy-efficiency

 e. COVID-19 may be changing the way we think of "resilience" in buildings. Previously, our concepts of "resilience" didn't include responding to a pandemic

   i. https://www.imt.org/what-are-healthy-buildings/

 f. Energy data from office building portfolios suggests a drop of only about 20% in largely unoccupied office buildings during the pandemic:

   i. https://facilityexecutive.com/2020/04/u-s-office-building-energy-use-a-snapshot-during-covid-19-crisis/

 g. New virus-prevention and mitigation technologies (e.g., more extensive use of UV disinfection) may increase energy use; TBD for data on this

4. Governmental Policy

 a. Municipal

   i. In March 2020, Columbus became the first city in Ohio to pass a building energy benchmarking ordinance. Phase-in by building size; buildings greater than 100,000 ft2 report in first year, then 50,000 ft2 in subsequent years: https://energynews.us/2020/04/14/midwest/columbus-energy-benchmarking-ordinance-is-a-first-for-ohio/

   ii. In June 2019, Des Moines, IA passed a benchmarking ordinance for buildings 25,000 and larger: https://www.dsm.city/initiatives/buildingbenchmarking.php

   iii. Latest IMT map of benchmarking policies updated March 2020: https://www.imt.org/resources/map-u-s-building-benchmarking-policies/

U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond

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  iv. In April, St. Louis adopted the Midwest's first Building Energy Performance Standard. It is the fourth building performance standard in the U.S. Similar to DC BPS, although reporting in site EUI not ENERGY STAR score. Targets for each property type based on past three years of benchmarking data: https://www.imt.org/st-louis-passes-first-building-performance-standard-in-the-midwest/. Bonus: An interview with local St. Louis officials about how they got the law passed: https://www.imt.org/behind-the-scenes-interview-st-louis-building-performance-standard/

  v. Latest NYC benchmarking data provides a first look at energy performance of medium-sized (25,000 – 50,000 ft2) buildings. Medium multifamily buildings have the highest EUIs among multifamily buildings; many use oil and gas: https://www.urbangreencouncil.org/content/news/outsized-emissions-medium-sized-buildings

  vi. Considerable focus in NYC on electrification and grid-optimal buildings in response to carbon target from LL97; also NBI and USGBC's GridOptimal Buildings Initiative, and focus on real-time energy management: https://www.urbangreencouncil.org/content/news/building-towards-low-carbon-grid

  vii. In November 2019 NYC LL92 and LL94 went into effect requiring all new construction and major renovations must install solar panels, green roofs, or a combination of both: https://www.urbangreencouncil.org/content/projects/nycs-sustainable-roof-laws

  viii. Recent study of NYC LL87 audit data showed savings of 2.5% for multifamily residential and 4.9% for office buildings, concluding that audits are expensive and insufficient to meet city targets: https://www.nature.com/articles/s41560-020-0589-6?proof=true19

 b. State
  i. ASHRAE Standard 100 adopted as the basis for Washington State's building performance standard

 c. U.S. Federal
  i. DOE scoping study underway to determine the impact of COVID-19 on building energy performance; makes use of Energy Data Vault, a secure user test bed for storing building energy data and testing algorithms

 d. International
  i. Canada has adopted Standard 100 target methodology for their climate zones and are adopting

5. Data and Databases
 a. CBECS
  i. 2018 CBECS data collection is complete. Response rates were somewhat lower than expected, although participation rates in federal surveys has been declining. Final sample size expected to be similar to 2012 CBECS (6,720 buildings). Building characteristics tables expected in Summer 2020: https://www.eia.gov/consumption/commercial/

 b. RECS
 c. BPD
  i. Currently getting a new user interface; will also include time series comparisons of performance in subsequent years
  ii. Can register for upcoming DOE training on using the BPD: https://register.gotowebinar.com/register/5517962183640964619

6. **Benchmarking Tools**
    a. ENERGY STAR
        i. 2020 ENERGY STAR Top Cities List shows that 5,600 buildings were certified using ENERGY STAR in 2019. Top three cities by number of certifications: LA, DC, SF: https://www.energystar.gov/buildings/topcities
    b. Other tools
        i. Building EQ
            1. Currently over 1000 users and almost 800 projects underway
        ii. DOE Asset Score
            1. Becoming more widely used in conjunction with Audit Template Tool; Most of the NYC LL87 reporting buildings have had an asset score generated as part of reporting
    c. Recent and upcoming DOE training on building energy data tools:
        i. Introduction to Asset Score: https://betterbuildingssolutioncenter.energy.gov/webinars/training-introduction-asset-score
        ii. Introduction to Audit Template: https://betterbuildingssolutioncenter.energy.gov/webinars/training-introduction-audit-template
        iii. Introduction to SEED: https://betterbuildingssolutioncenter.energy.gov/webinars/training-introduction-standard-energy-efficiency-exchange-platform-seed
        iv. Introduction to the Building Efficiency Targeting Tool for Energy Retrofits (BETTER): https://register.gotowebinar.com/register/842394539169519630
    d. End-Use Load Profiles
        i. Ongoing NREL project validating end use load profiles in commercial and residential buildings: https://www.nrel.gov/buildings/end-use-load-profiles.html

7. **ASHRAE Sessions of Interest**

   Monday June 22, 8:00 AM - 9:00 AM
   Seminar 12 Winners and Winning Solutions from the ASHRAE Great Energy Predictor III Machine Learning Competition

   Monday June 22, 8:00 AM - 9:00 AM
   Seminar 7 The Next Giant Leaps: Tech Transfers and Carbon Neutral Systems for a Resilient Built Environment

   Monday June 22, 8:00 AM - 9:00 AM
   Seminar 54 The Process for Zero Energy Multifamily Buildings: The Next ASHRAE Advanced Energy Design Guide

   Monday June 22, 8:00 AM - 9:00 AM
   Paper Session 6 Getting Smarter: Data-Driven Prediction and Load Profiles in Residential Buildings

   Monday June 22, 8:00 AM - 9:00 AM
   Paper Session 7 Zero Energy Buildings: Embodied Carbon Emissions, Case Study and Energy Codes

Monday June 22, 8:00 AM - 9:00 AM
[Seminar 24 Energy Performance in Tall Buildings: What Can We Do?](#)

Monday June 22, 8:00 AM - 9:00 AM
[Seminar 34 Zero-Net Energy Hospitals: Is this a Myth?](#)

Tuesday, June 30, 12:30 PM - 1:40 PM
[Seminar 25 SARS, MERS, Ebola, COVID-19: How to Prepare for the Next Epidemic](#)

Tuesday, June 30, 3:10 PM - 4:20 PM
[Workshop 1 Crafting an O&M Plan for a Net Zero/Passive House: An Interactive Workshop](#)

Thursday, July 2, 2020, 3:10 PM - 4:20 PM
[Impact of COVID-19 on Buildings](#)